Application Packaging Lore Book

Jose Schenardie

Sponsors

onedeploy
Windows Deployment Reimagined

ZERO TOUCH

Insight

control up

PATCH MY PC

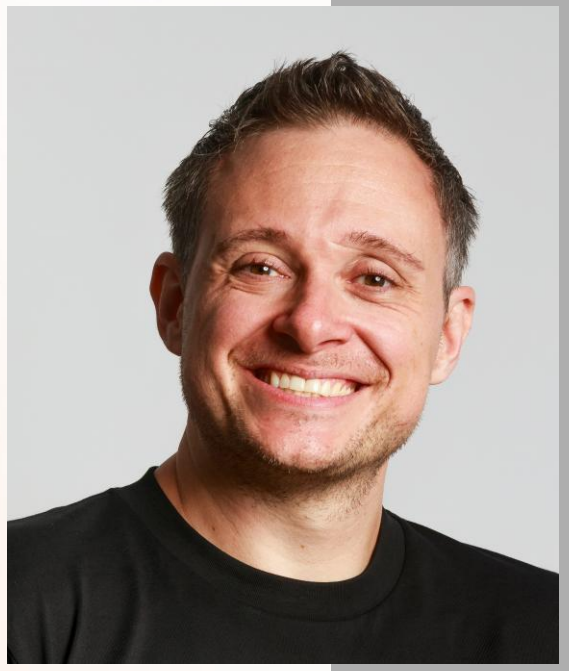
Rimo3

robopack

numecent

Microsoft

That’s a me



Jose Schenardie
Microsoft MVP · Security

Role
CTO - Devicie

Focus
Intune · R&D · AI

Blog
https://msendpointmgr.com
https://intune.tech

Agenda

- Getting Started with App Packaging
- Packaging Process
- Public / Private Repos
- Tools

Getting Started with App Packaging

It all starts with a need

I need to install software X for department/user Y and keep it up to date

Followed by an evaluation of

Risk

How critical is this software and its updates and how often are they released?

How quick do I need to get updates packaged and deployed?

How likely is this software to have a vulnerability exploited in the wild?

Followed by an evaluation of

Effort

How long will it take for me to package this software:

Manually

With automation

Using a third party*

Followed by an evaluation of

*Cost

Is the cost:

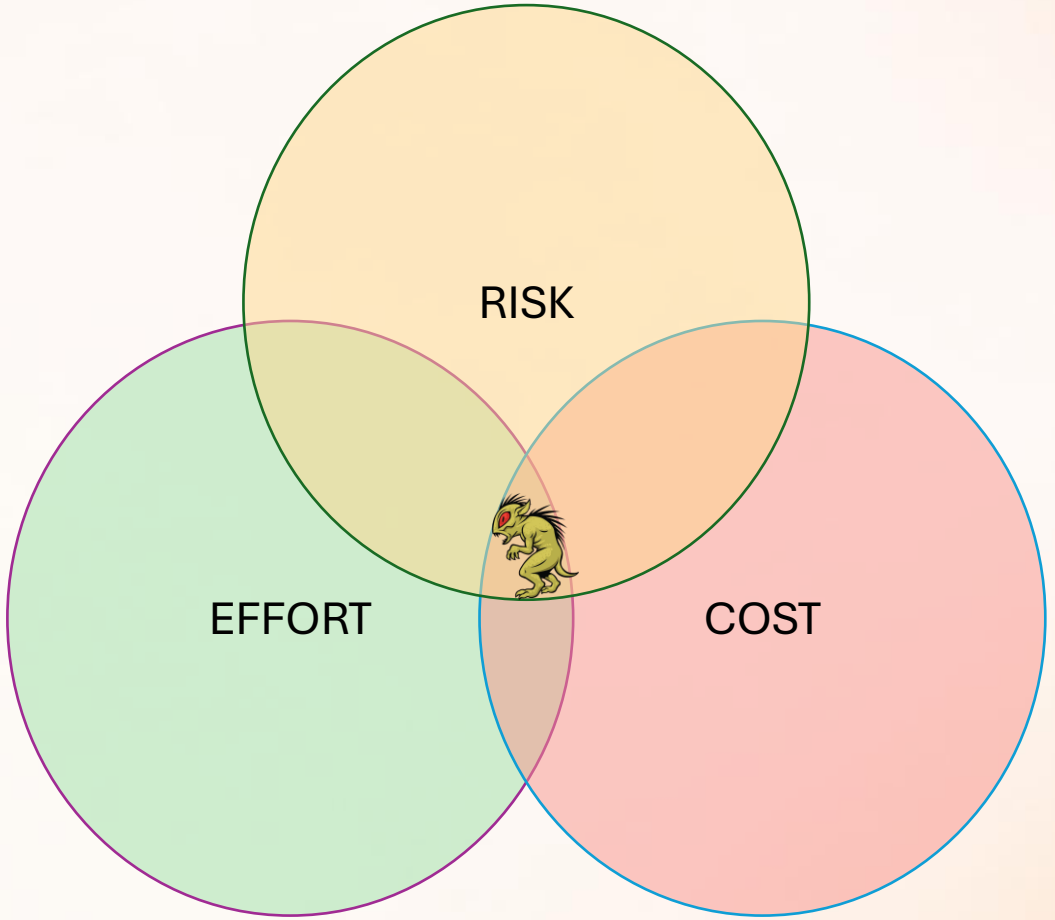
Man hours?

Per user per month?

For resources of open-source solution (deployed on my cloud)

Embedded on license (E5/E7)

That leads us to



Packaging Process

It all starts with metadata

Media file (aka MSI, EXE, ZIP, MSIX)

- Download URL
- Hash Validation

Detection information

- ARP Version (*custom)
- MSI Version
- File Version
- Registry

Example 1

Vendor Website

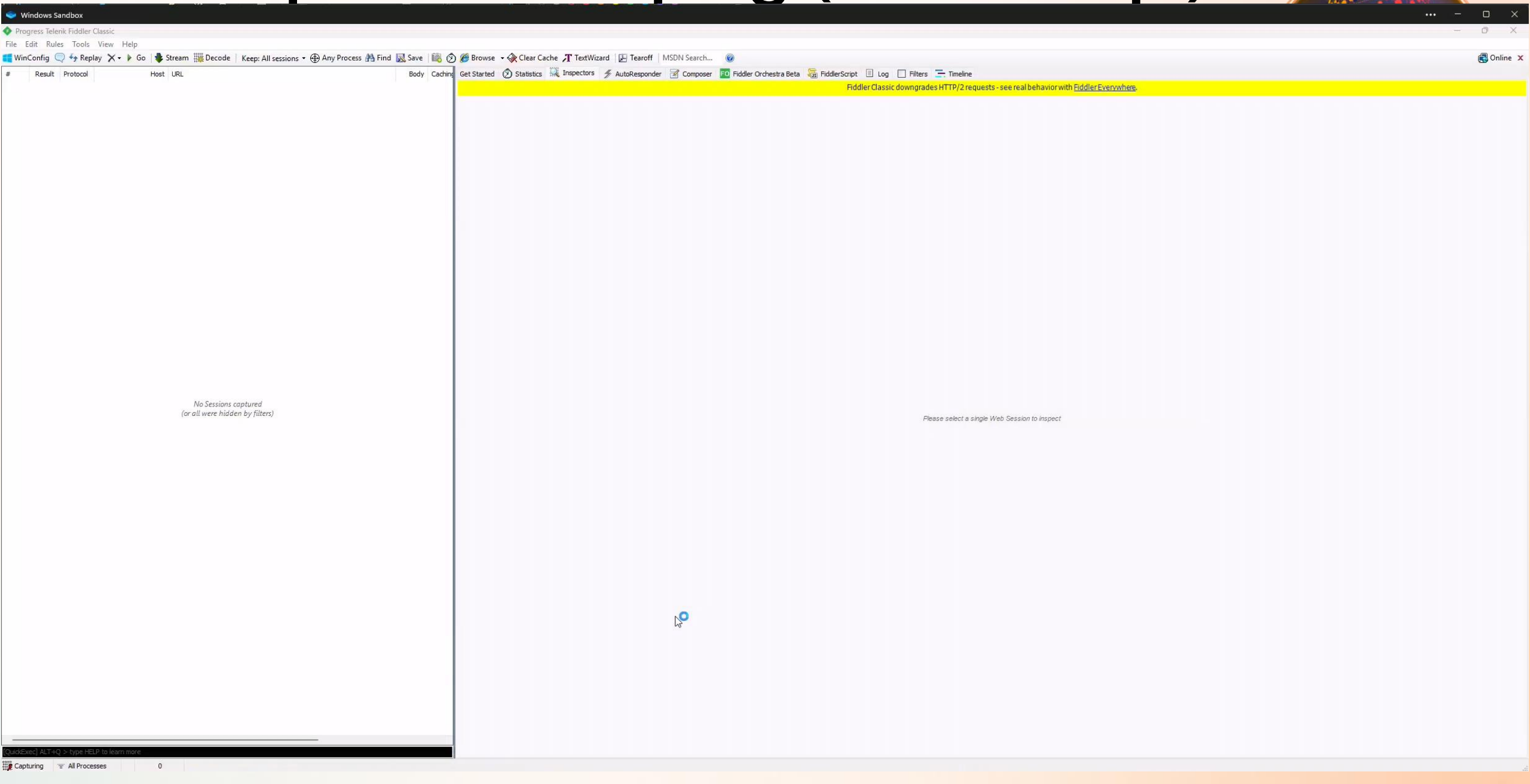
https://code.visualstudio.com/download#

https://code.visualstudio.com/sha/download?build=stable&os=win32-x64

Vendor Website

https://vscode.download.prss.microsoft.com/dbazure/download/stable/560a9dba96f961efea7b1612916f89e5d5d4d679/VSCodeSetup-x64-1.116.0.exe

Self Update Snooping (internal api)



Update URLs

1.104.1 x64

https://update.code.visualstudio.com/api/update/win32-x64/stable/0f0d87fa9e96c856c5212fc86db137ac0d783365

1.105.0 x64

https://update.code.visualstudio.com/api/update/win32-x64/stable/03c265b1adee71ac88f833e065f7bb956b60550a

1.105.0 arm64

https://update.code.visualstudio.com/api/update/win32-arm64/stable/03c265b1adee71ac88f833e065f7bb956b60550a

Copy and paste does not work between projects opened in dev containers #271012

Open

Edits

Does this issue occur when all extensions are disabled?: Yes (except those needed for dev containers)

```
Version: 1.105.0 (Universal)
Commit: 03c265b1adee71ac88f833e065f7bb956b60550a
Date: 2025-10-08T14:09:35.891Z
Electron: 37.6.0
ElectronBuildId: 12502201
Chromium: 138.0.7204.251
Node.js: 22.19.0
V8: 13.8.258.32-electron.0
OS: Darwin arm64 25.0.0
```

Steps to Reproduce:

1. Open two different projects in a dev container (mounted source code)
2. Select a file in project A explorer, and select copy from the right click menu.
3. Switch to project B, and select paste from the right click menu in the explorer.

The following error popup will occur:

```
The file(s) to paste have been deleted or moved since you copied them. Error: ENOENT: no such file or directory, stat
```

Copy/Cut and Paste do not seem to have awareness of the dev container. Ideally, there would be clipboard metadata added that would allow VSCode to reference the host pathname, or otherwise identify that the origin of the paste operation was in another dev container, and there would be some mechanism to accomplish the paste operation.

👍 2

vs-code-engineering added new release on Oct 13, 2025

Example 2

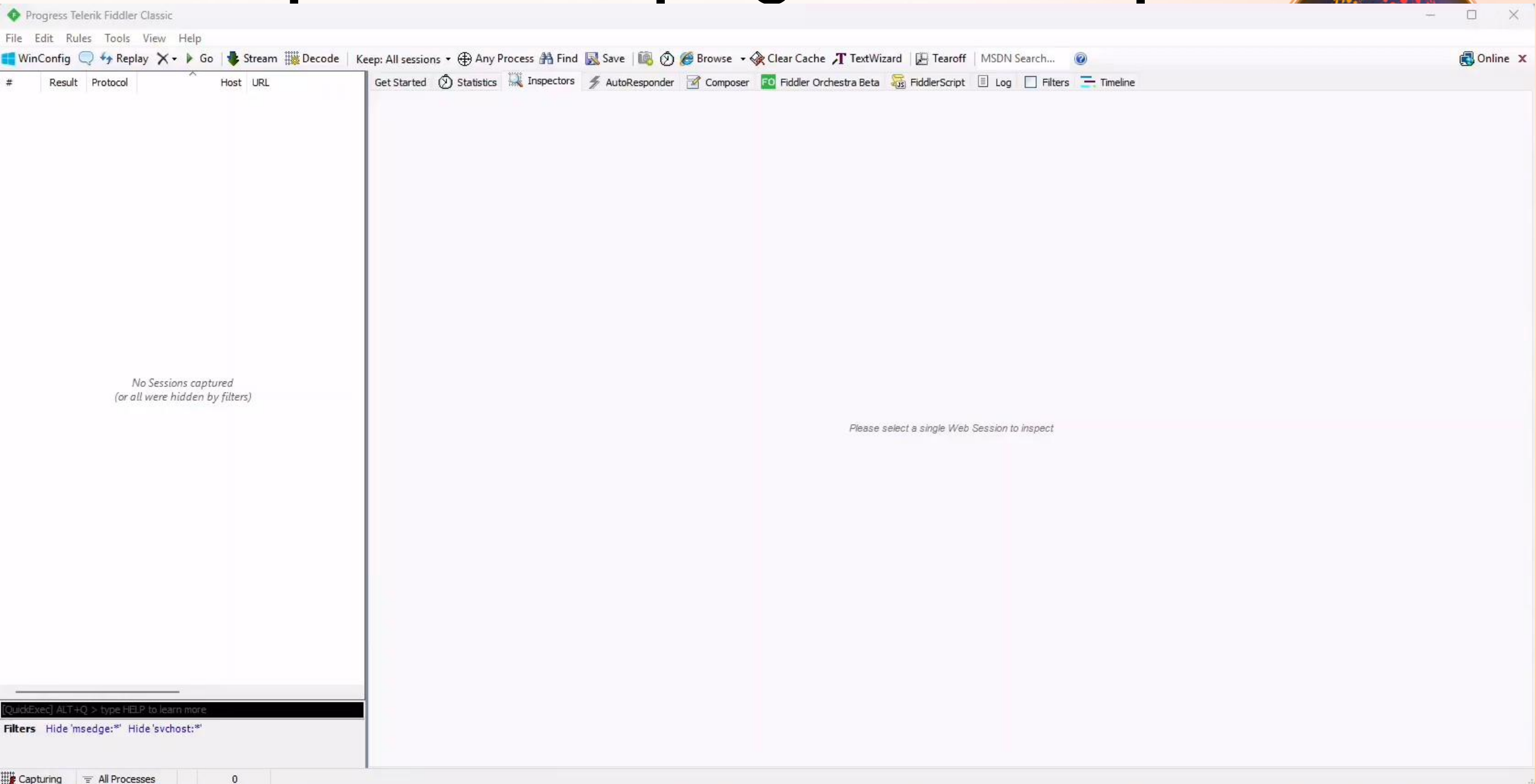
Vendor Website

https://notepad-plus-plus.org/downloads/

https://notepad-plus-plus.org/downloads/v8.9.1/

https://github.com/notepad-plus-plus/notepad-plus-plus/releases/download/v8.9.1/npp.8.9.1.Installer.x64.exe

Self Update Snooping (internal api)



ate URLs

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Notepad++ Official Update Mechanism Hijacked to Deliver Malware to Select Users

Feb 02, 2026

Notepad++ Hijacked by State-Sponsored Hackers

2026-02-02

Following the securit… the v8.8.9 announcement
https://notepad-plus-… sed/
the investigation has … with external experts and
the full involvement c… hosting provider.

MALWARE

Nation-State Actors Exploit Notepad++ Supply Chain

8 min read

…etDownloadUrl.php?version=8.9&param=x64

https://github.com/notepad-p… …d/v8.9

Notepad++ Supply Chain Attack & Chrysalis Backdoor

8 MIN READ | MARCH 02, 2026

SUMMARIZE WITH: ChatGPT | perplexity | Google AI

Between June and December 2025, the update infrastructure for the popular text editor Notepad++ was compromised, allowing threat actors to distribute malicious updates to targeted users. The breach originated from an incident at the hosting provider level, which granted the attackers access to internal services for several months.

During this period, three distinct infection chains were observed, targeting organizations in the government, financial, and IT sectors across Vietnam, El Salvador, Australia, and the Philippines [1].

Notepad++ Hijacked by State-Sponsored Hackers

2026-02-02

Following the security disclosure published in the v8.8.9 announcement
https://notepad-plus-plus.org/news/v889-released/
the investigation has continued in collaboration with external experts and with the full involvement of my (now former) shared hosting provider.

According to the analysis provided by the security experts, the attack involved infrastructure-level compromise that allowed malicious actors to intercept and redirect update traffic destined for notepad-plus-plus.org. The exact technical mechanism remains under investigation, though the compromise occurred at the hosting provider level rather than through vulnerabilities in Notepad++ code itself. Traffic from certain targeted users was selectively redirected to attacker-controlled malicious update manifests.

The incident began in June 2025. Multiple independent security researchers have assessed that the threat actor is likely a Chinese state-sponsored group, which would explain the highly selective targeting observed during the campaign.

An incident-response (IR) plan was proposed by the security expert, and I facilitated direct communication between the hosting provider and the IR team. After the IR team engaged with the provider and reviewed the situation, I received the following detailed statement from the provider:

This XML file does not appear to have any style information associated with it. The document tree is shown below.


```
<GUP>
  <NeedToBeUpdated>yes</NeedToBeUpdated>
  <Version>8.9.3</Version>
  <Location>https://1.76.155.202/update/update.exe</Location>
  <Signature xmlns="http://www.w3.org/2000/09/xmldsig#">
    <SignedInfo xmlns="http://www.w3.org/2000/09/xmldsig#">
      <CanonicalizationMethod Algorithm="http://www.w3.org/TR/2001/REC-xml-c14n-20010315"/>
      <SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
      <Reference URI="">
        <Transforms>
          <Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
        </Transforms>
        <DigestMethod Algorithm="http://www.w3.org/2001/04/xmlenc#sha256"/>
        <DigestValue>H/yYUXFpLXDG6atF3sz8f6AydwypFRswQkWkuBnxCSQ=</DigestValue>
      </Reference>
    </SignedInfo>
    <SignatureValue>WmMitCHgdszw+R8aOvN2o0X/aOE/BHmGauv+LECkUBuk9XMRYjR1r0ZYdTU9NdZcYHhXhQacHBzey7azhfOnWWGg6b3MDvy5TWEfEEDcK5yW5HP/Bv7eWO04jf7OWr6ndDs5cHUEa+FTP+opdR5ZLe6QX7OYJX4JfcXBn7oDfznDVag8dx8ul8bHAKw/+wP
    </SignatureValue>
    <KeyInfo>
      <X509Data>
        <X509Certificate>MIIHKDCCBRCgAwIBAgIMBfDYE9am8ARXWiCZMA0GCSqGSIb3DQEBCwUAMFkxCzAJBgNVBAYTAkJFMRkwFwYDVQQKExBHbG9iYWxTaWduIG52LXNhMS8wLQYDVQQDEyZHbG9iYWxTaWduIEdDQyBSNDUgQ29kZVNpZ25pbmcgQ0EgMjAyMDAeFw0yNTE
      </X509Data>
    </KeyInfo>
  </Signature>
</GUP>
```

GitHub Version Control

https://api.github.com/repos/{vendor}/{project}/releases/latest

```
<Location>https://github.com/notepad-plus-plus/notepad-plus-plus/releases/download/v8.9.1/npp.8.9.1.Installer.x64.exe</Location>
```

https://api.github.com/repos/notepad-plus-plus/notepad-plus-plus/releases/latest

https://github.com/notepad-plus-plus/notepad-plus-plus/releases/latest

GitHub Version Control

https://api.github.com/repos/notepad-plus-plus/notepad-plus-plus/releases/latest

Pretty-print

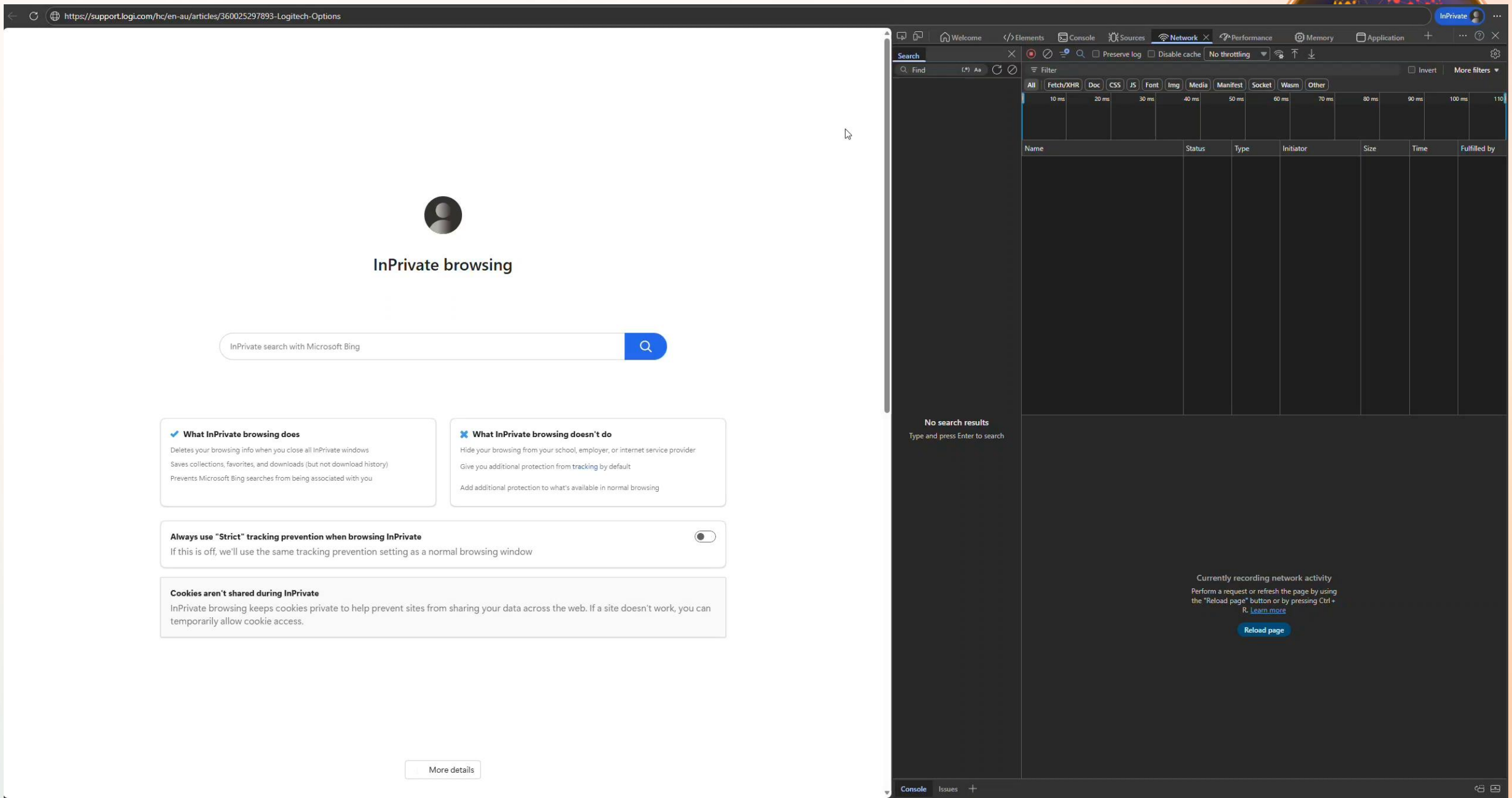

```
  },
  "node_id": "RE_kwDOAffEG84RGRLO",
  "tag_name": "v8.9.2",
  "target_commitish": "master",
  "name": "Notepad++ release 8.9.2",
  "draft": false,
  "immutable": false,
  "prerelease": false,
  "created_at": "2026-02-16T13:24:19Z",
  "updated_at": "2026-02-16T13:31:10Z",
  "published_at": "2026-02-16T13:27:08Z",
  "assets": [
```

Example 3

Vendor External API

https://support.logi.com/hc/en-au/articles/360025297893-Logitech-Options

Vendor External API



Vanity URLs

https://zoom.us/client/latest/ZoomInstaller.exe?archType=winarm64

https://code.visualstudio.com/sha/download?build=stable&os=win32-arm64

Vanity URLs

Cause issues with:

- Gradual Rollouts
- SHA verifications

Public / Private Repos

Definition

- Private repo
  https://apps.microsoft.com/home

- Public repo
  https://github.com/microsoft/winget-pkgs

- Enterprise Application Manager repo =
  **********.com

Private Repo Getting Started

Create account (MS Account)

Validate ID / Company

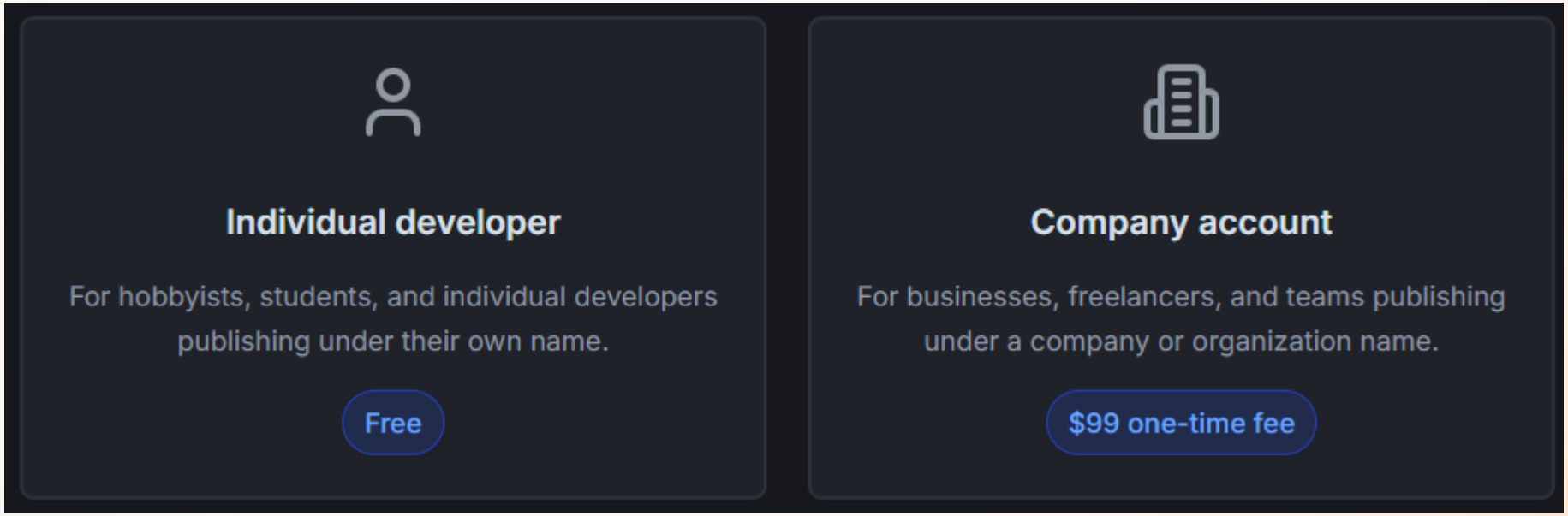
Account setup

App submission

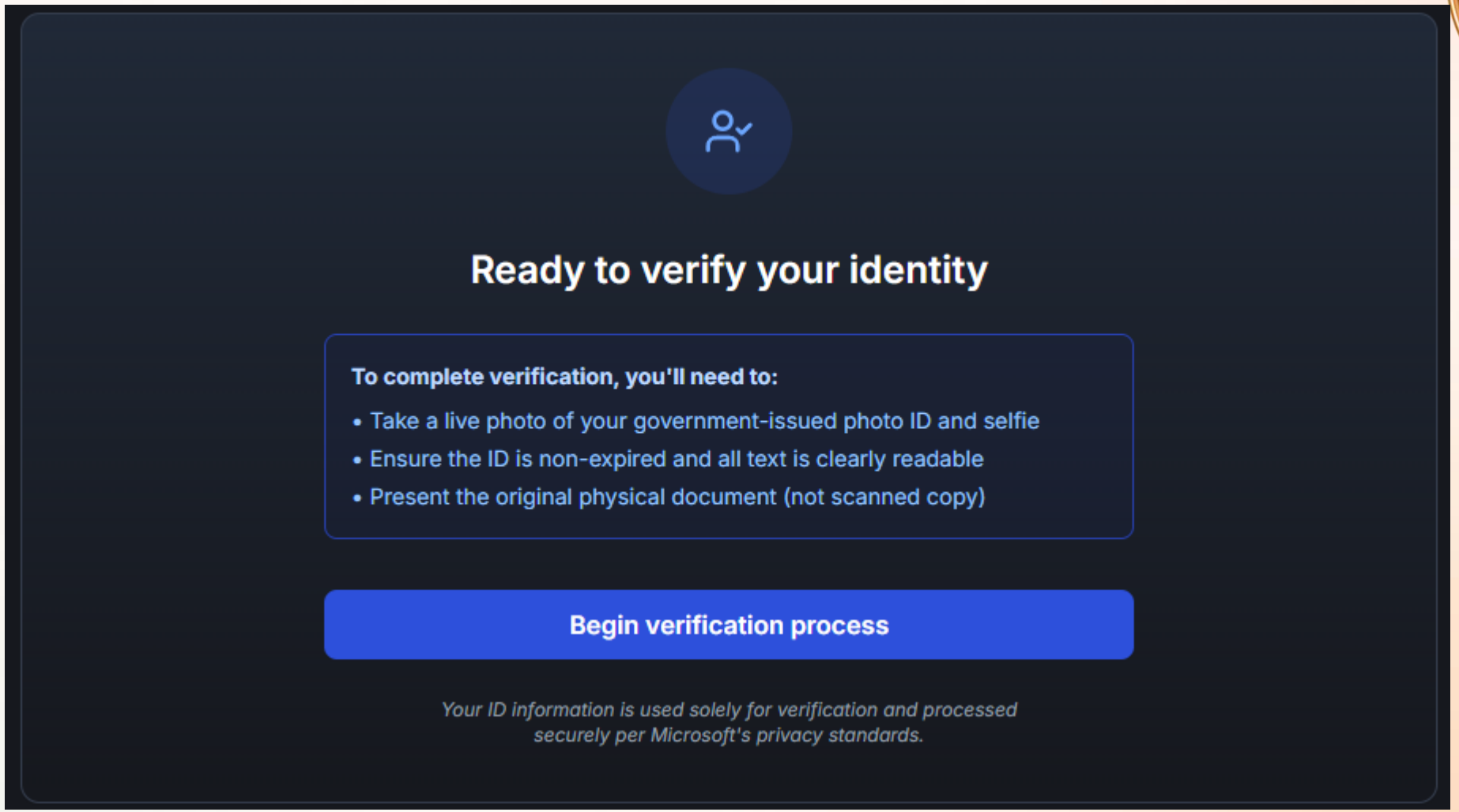
App certification

Private repo Account Type

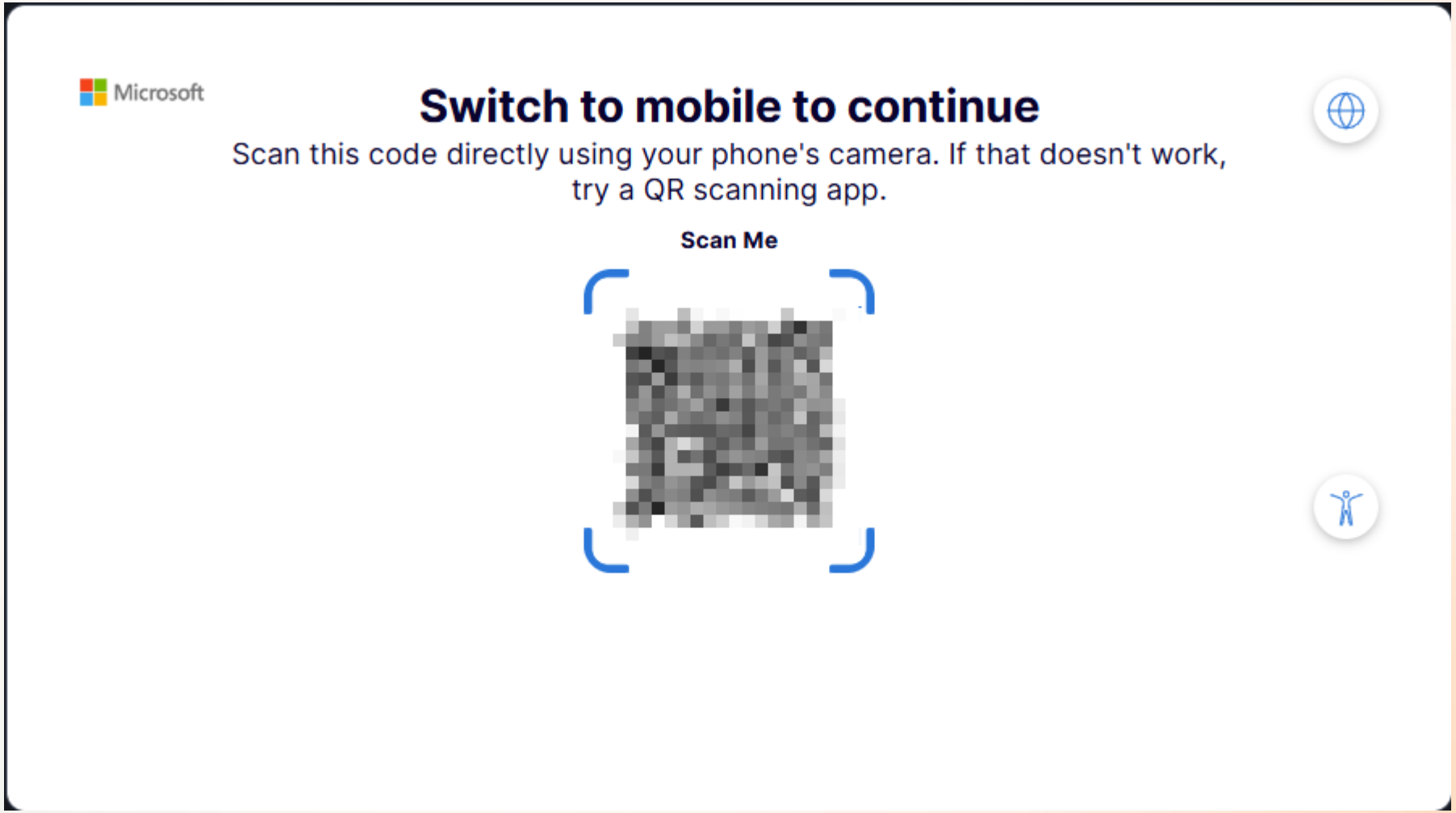
[Microsoft Store Developer Platform]



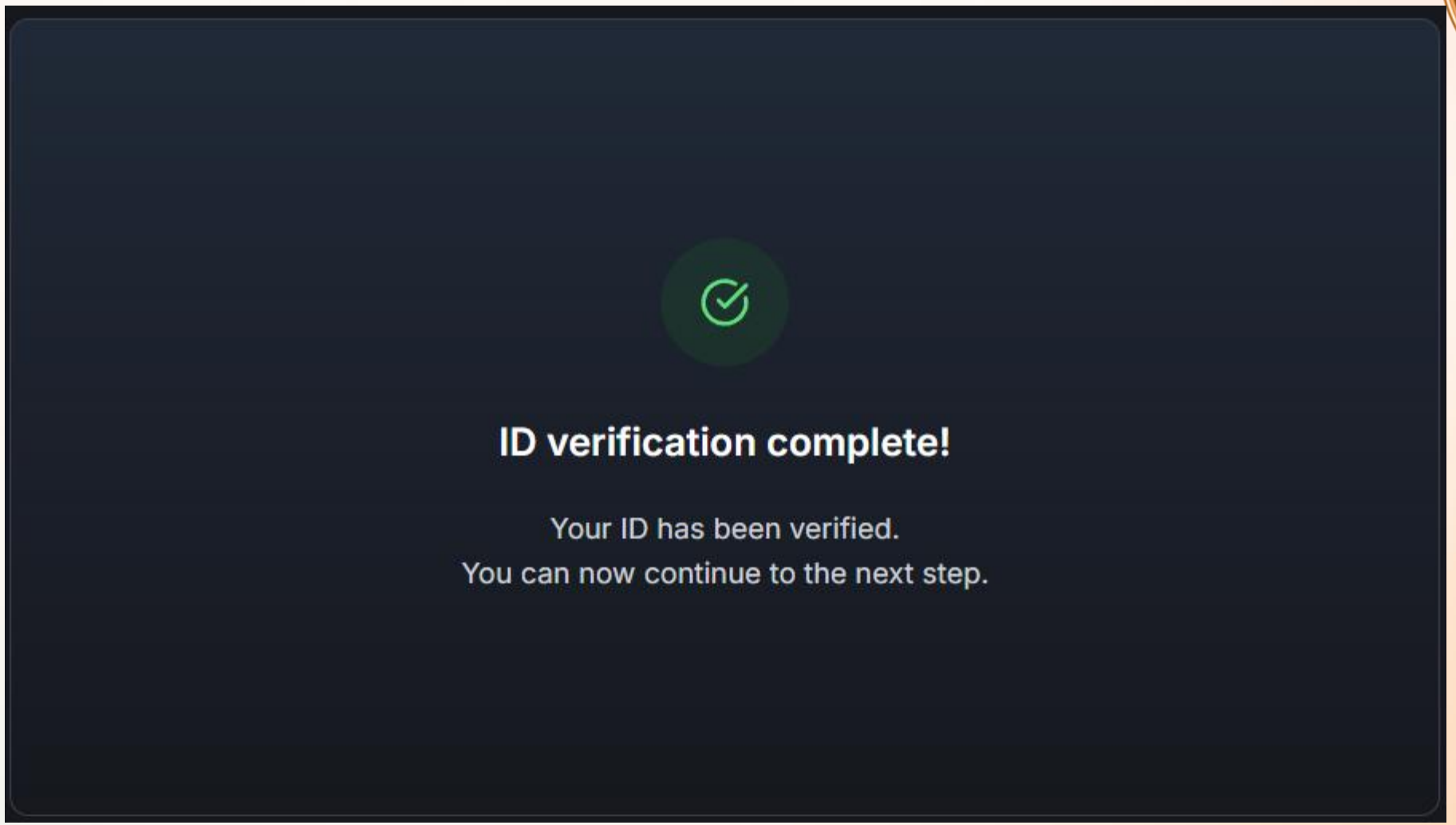
Private repo ID Verification



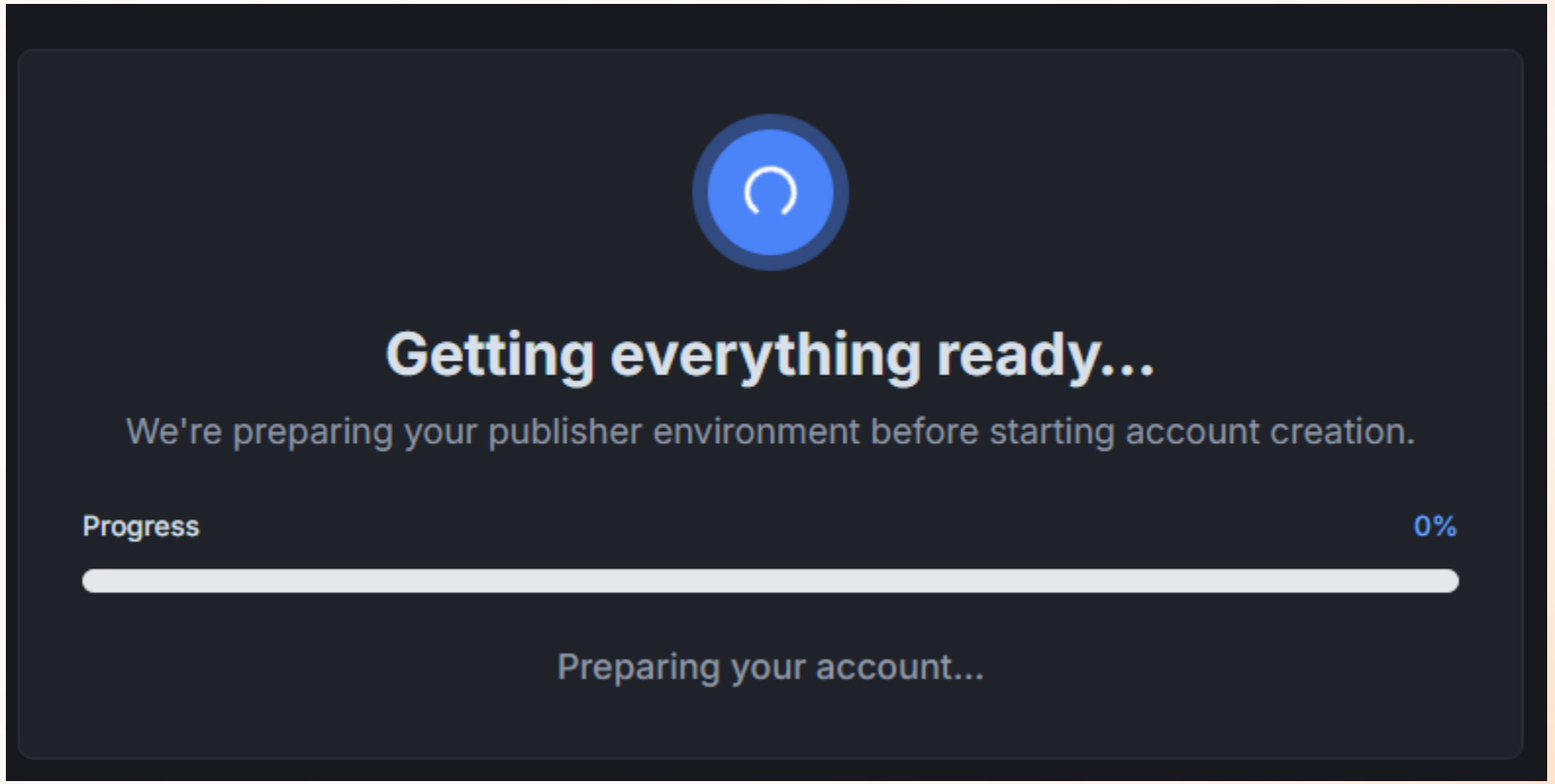
Private repo ID Verification



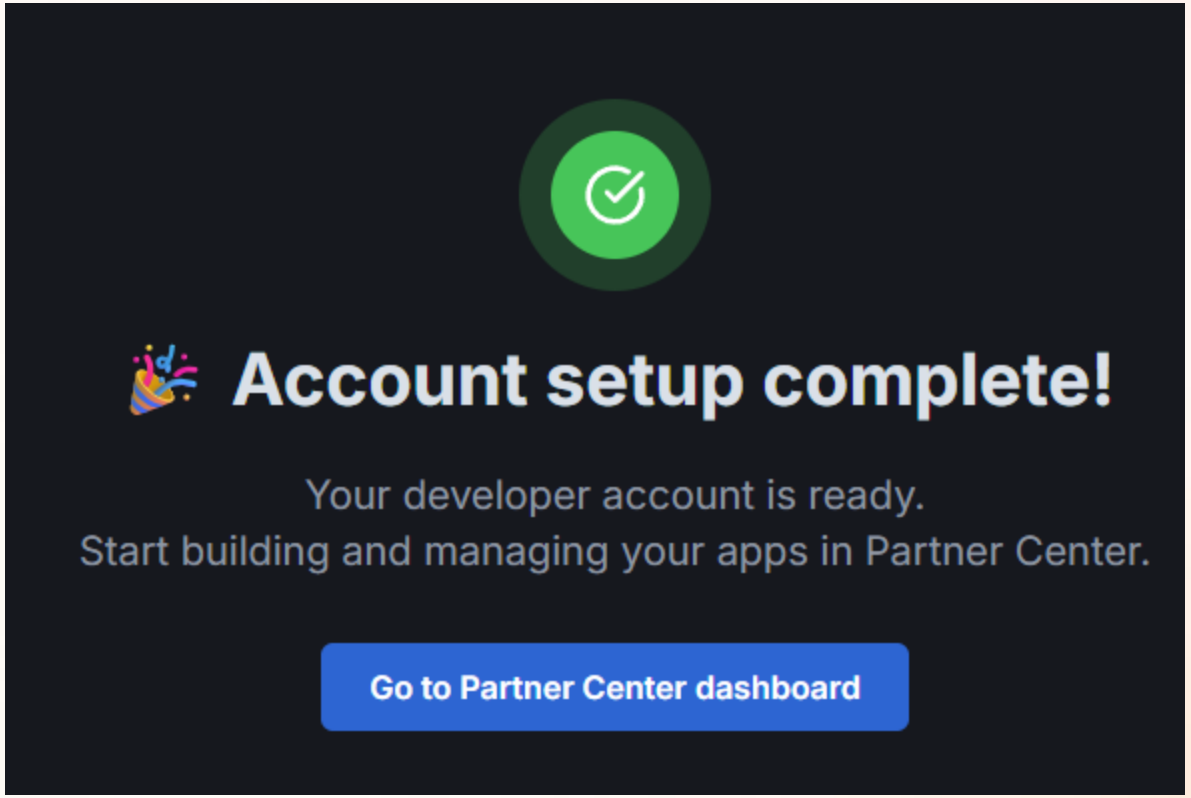
Private repo ID Verification



Private repo Account Setup



Private repo Account Setup



App Submission

- Choose app type
  - MSIX or PWA
  - EXE or MSI
  - Game

- Reserve Name
- Pricing and Availability (worldwide or specific countries)
- Properties (Category, support, etc)
- Age Ratings
- Packages (Windows versions)
- Store listings (extra languages)
- Submission Options (ASAP, date, manual)

App Certification

- **Security tests:** This first test checks your app's packages for viruses and malware. If your app fails this test, you'll need to check your development system by running the latest antivirus software, then rebuild your app's package on a clean system.

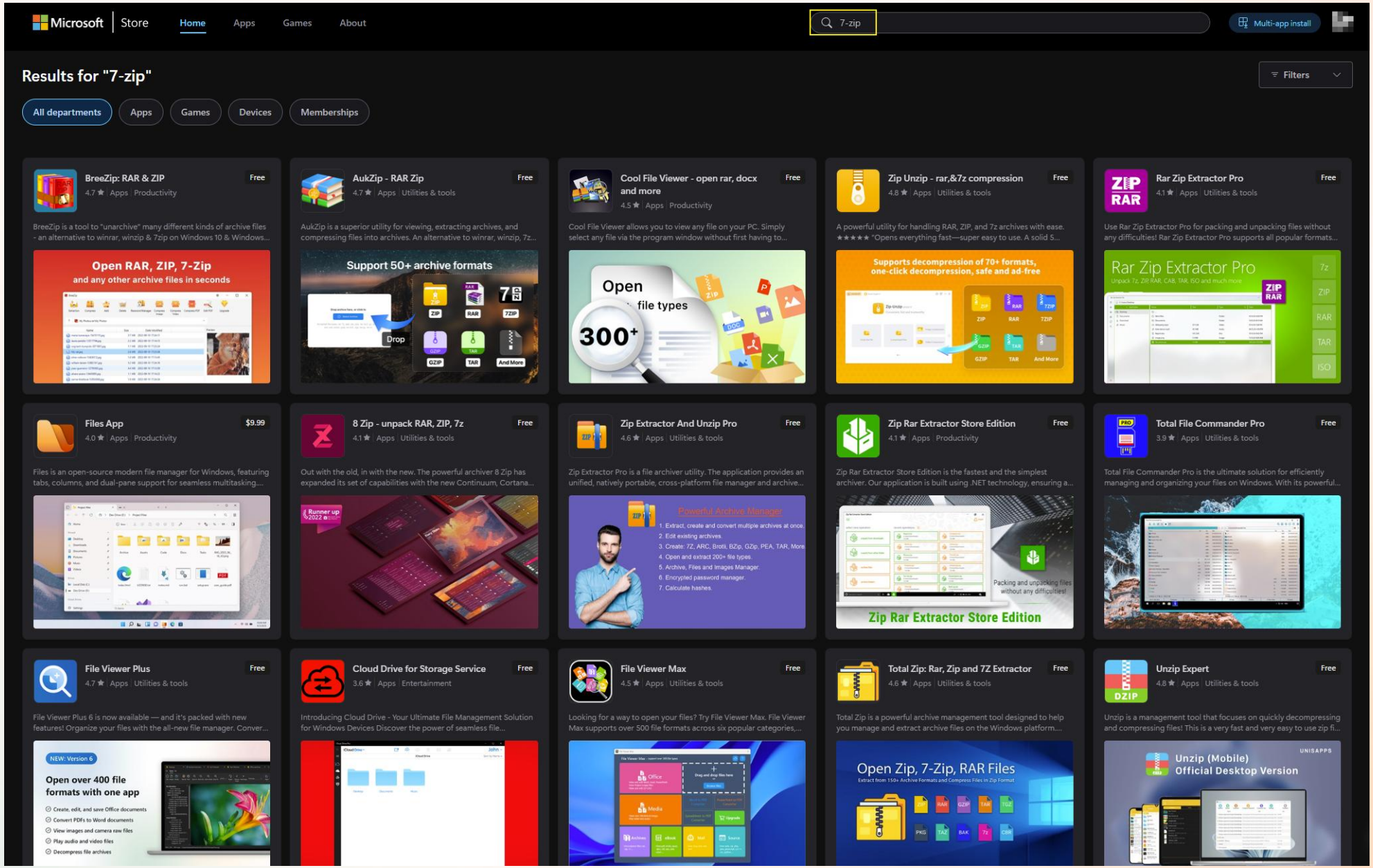
- **Technical compliance tests:** Technical compliance is tested by the Windows App Certification Kit.

- **Content compliance:** The amount of time this takes varies depending on how complex your app is, how much visual content it has, and how many apps have been submitted recently. Be sure to provide any info that testers should be aware of in the Notes for certification page.

*Between 1-3 business days

The app certification process for MSIX app

Welcome to MS Store



Public Repo Getting Started

Create account (Github Account)

~~Validate ID / Company~~

~~Account setup~~

App submission

App certification

Account Setup

[Github Signup]

Sign up for GitHub

Continue with Google

Continue with Apple

or

Email*

Email

Password*

Password

Password should be at least 15 characters OR at least 8 characters including a number and a lowercase letter.

Username*

Username

Username may only contain alphanumeric characters or single hyphens, and cannot begin or end with a hyphen.

Your Country/Region*

Australia

For compliance reasons, we're required to collect country information to send you occasional updates and announcements.

Email preferences

Receive occasional product updates and announcements

Create account ›

By creating an account, you agree to the Terms of Service. For more information about GitHub's privacy practices, see the GitHub Privacy Statement. We'll occasionally send you account-related emails.

App Submission

Wingetcreate

wingetcreate new url

Komac

komac token add

komac new

App Certification

Pipelines - Runs for WinGetSvc-Validation

Control	What it does?	Why It Really Matters?
PR-only, hardened pipeline	Validation runs **only on pull requests**, with no secrets exposed to forks	Stops attackers from abusing the pipeline itself to steal tokens or run arbitrary code
Manifest + policy enforcement	Every submission must strictly follow WinGet schemas and policies	Prevents deceptive packages, typosquatting, and metadata trickery
Installer hash verification (SHA256)	The installer's hash must match what's declared in the manifest	Blocks silent binary swaps, CDN compromise, and post-submission tampering
Malware scanning + SmartScreen reputation checks	Installers are scanned and Microsoft reputation data is consulted before approval	Catches known malware before it ever reaches users and flags low-trust, newly weaponized, or suspicious installers
Sandbox install & uninstall testing	Package is installed and removed in an isolated environment	Detects fake silent installs, persistence tricks, and broken installers
Manual review as backstop	Validate all new packages and checks other suspicious things	Final human component to verify things machines can't (I hope ☺)

App Certification

Pipelines - Runs for WinGetSvc-Publish

Control	Why It Really Matters?
Malicious PR publishes package	Publish pipeline cannot run from PRs
Fork contributor steals secrets	No secrets exposed to forks
Tampering between validation and publish	Git commit immutability + full history
Publishing unreviewed binaries	No binaries are built or uploaded
Silent feed mutation	Azure RBAC + storage auditing
Replay / partial publish	Batch mode + single authoritative feed

App Certification

winget-pkgs/Tools/ManualValidation at master · microsoft/winget-pkgs

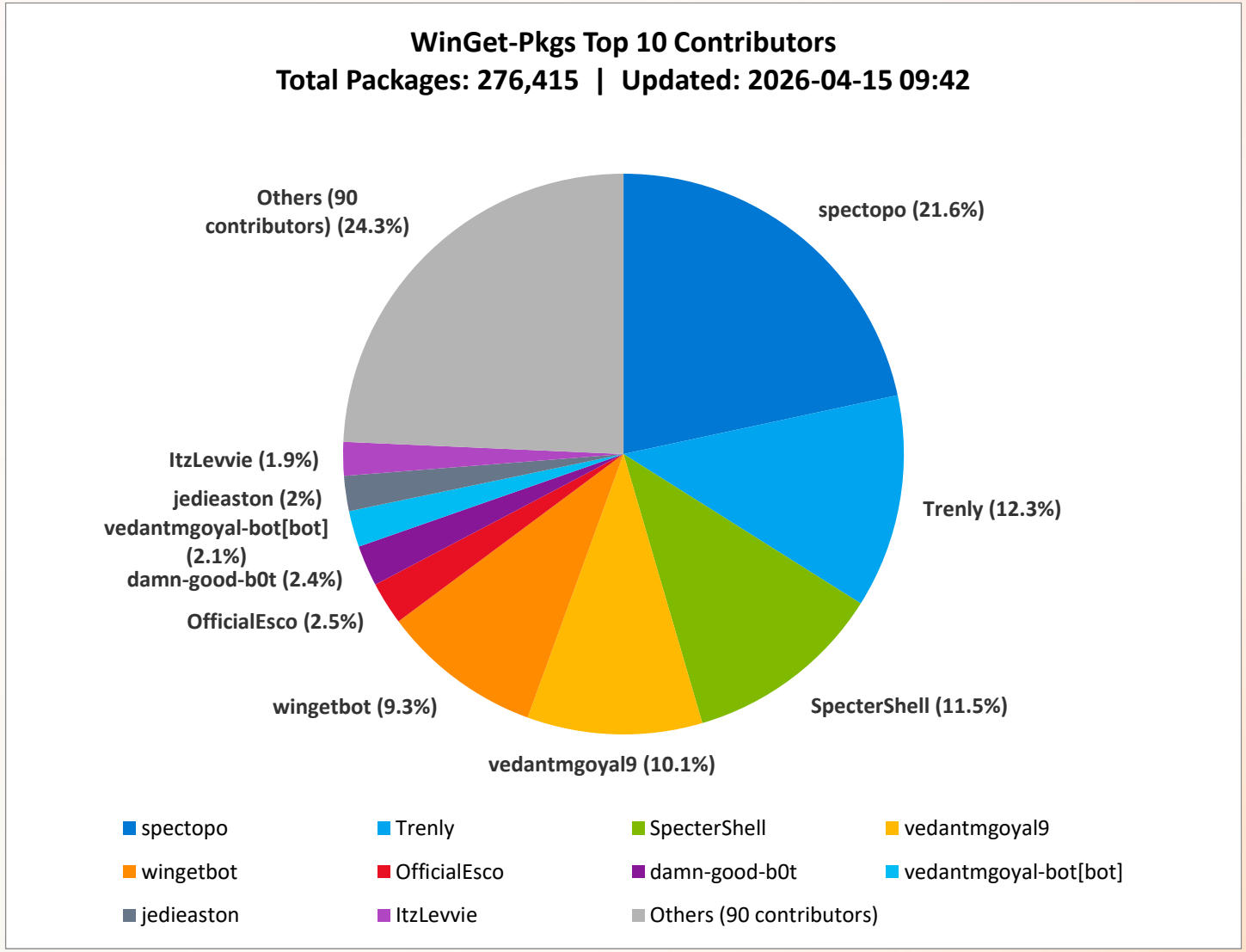
New version: BenthicSoftware.GoldSqall.2 version 2.4.0.240 by schenardie · Pull Request #349203 · microsoft/winget-pkgs

wingetbot commented last month — Collaborator

Inconsistencies detected in package `BenthicSoftware.GoldSqall.2` version `2.4.0.240` based on published version `2.2.0.222`

- Missing property `ReleaseNotes`
- Missing property `ReleaseNotesUrl`

Submission Statistics



source

Tools

Testing Apps

Run in Sandbox - Joly0

Intunewin RightClick Extract - Damien Van Robaeys

PsExec - Sysinternals | Microsoft Learn

Re-packaging Apps

Master Packager

InstEd It! - Download instead

PSAppDeployToolkit

Paas Packaging

Intune App Factory - MSEndpointMgr

Saas Packaging

IntuneGet | Free Intune App Deployment Tool

Intune Awesome Packaging

[Awesome Intune - Browse Packaging Solutions]

IntuneWin Utility Packaging
IntuneWin Utility is a modern GUI tool for creating Microsoft...
Mohammed O... 2.1k View

WinGet-PSADT-GUI-Tool Packaging
WinGet-PSADT-GUI-Tool is a Windows PowerShell WPF GUI that...
Dhiraj Dhote 2k ↑ 1 View

IntuneGet Packaging
A web-based tool that automates deploying Windows...
Ugur Koc 3.4k ↑ 1 View

PSADT Helper Packaging
PSADT Helper has the function in it, it lets you easily migrate thos...
Roman Padrun 3.1k ↑ 1 View

IntuneWinAppUtil GUI Packaging
IntuneWinAppUtil GUI is a PowerShell-based WPF wrapper for...
Giovanni Solone 3.4k ↑ 2 View

PSADT Script Generator Packaging
Automatically generate PSADT deployment scripts for new...
Robert L 1.8k ↑ 1 View

PSAppDeployToolkit Packaging
PSAppDeployToolkit is a PowerShell-based, open-source...
PSAppDeployT... 6.9k ↑ 4 View

swiftDialog ESP Configurator Packaging
Built for MacAdmins who want smooth deployments with great...
Artem Brening 6k ↑ 3 View

Wintuner Packaging
WinTuner is a tool that lets you take any WinGet app and upload ...
Stephan van R... 4k ↑ 4 View

IntuneAppDoc.com Packaging
IntuneAppDoc.com automates creation of comprehensive...
Morten Glimme 1.9k ↑ 1 View

IntuneBrew Packaging
A macOS app deployment and patch management solution for...
Ugur Koc 3.7k ↑ View

Intune-App-Sandbox Packaging
Intune-App-Sandbox is a testing utility for PowerShell-based...
Maciej Horbacz 3.4k ↑ 1 View

AutomaTuner Packaging
A Python tool that automates packaging and deploying...
Ayoub Sekoum 18.7k ↑ 2 View

Deployment Editor Packaging
A visual software packaging editor for creating Windows...
Tugay Taskin 11k ↑ 2 View

IntunePrepTool Packaging
A PowerShell GUI tool for streamlining application packaging for...
Rink Turksma 2.8k ↑ View

IntuneWin32App Packaging
A PowerShell module for managing the complete lifecycle of...
Nickolaj Anders... 2.6k ↑ View

Please rate this session on Sched.com

We would love to hear what you liked and how we could improve!

Thanks!